

A REVISION OF THE GENUS BUMELIA IN THE UNITED STATES¹

ROBERT BROWN CLARK

Formerly Garden Apprentice, Missouri Botanical Garden

The genus *Bumelia* is the hardiest representative of the Sapotaceae in North America, occurring as far north as the lower valley of the Missouri River. It therefore differs from other members of this tropical and subtropical family in its adaptation to a temperate climate. The majority of species grow in mesophytic situations, although certain species have become well established in xerophytic habitats.

GENERAL MORPHOLOGY

Bumelia is distinguished morphologically from other genera of the Sapotaceae in the structure of the flower and fruit, for example: (a) a pair of lateral appendages flank each corolla-lobe, (b) staminodia replace a cycle of stamens, and (c) the seeds are without albumen and exhibit a circular, basal hilum.²

Stem: The stems are sometimes armed with simple or branched spines. The bark is reddish-brown, appearing gray in age, while the branchlets in certain species are somewhat pubescent. The wood is singularly tough, becoming brittle in *B. angustifolia*, invariably yellowish, and very close-grained.³ "Short-shoots," or brachyblasts, suggestive of certain gymnosperms, are frequently found in the leaf axils.

Corolla: The genus is characterized in part by the structure of its corolla, which is sympetalous through basal coalescence of the whitish petals to form a short tube. Each corolla-lobe bears a pair of lateral, petaloid appendages, thus constituting a pentamerous corolla with trifold lobes.⁴

¹ An investigation carried out in the Graduate Laboratories of the Henry Shaw School of Botany of Washington University and submitted as a thesis in partial fulfillment of the requirements for the degree of master of science in the Henry Shaw School of Botany of Washington University.

² Baehni, C., in *Candollea* 7: 424. 1938.

³ Record, S. J., in *Trop. Woods* 59: 26-27. 1939.

⁴ A completely satisfactory evaluation of the various components of the flower of *Bumelia*, especially the lateral appendages of the corolla-lobes, has not become established. Students of the Sapotaceae have merely suggested the probable origin and relationship of the appendages: Hartog, M. M., On the floral structure and affinities of Sapotaceae. *Jour. Bot.* 16: 66. 1878; Lam, H. J., On the system of the Sapotaceae. *Recueil Trav. Bot. Neerland.* 36: 519. 1939.

Androecium: The five fertile stamens are epipetalous and opposite the lobes of the corolla. The anthers are attached to slender filaments and dehisce extrorsely by means of longitudinal slits. The staminodia, alternating with the fertile stamens, are petaloid and at an early phase of anthesis form a tube through which the filiform style emerges while the rapidly maturing stamens are enclosed by the yet unexpanded corolla.

Gynoecium: The pistil is pentacarpellary. The superior ovary bears a simple, erect, relatively short style surmounted by an inconspicuous stigma that becomes receptive before the corolla is completely unfolded. Normally, the outer wall of the ovary is hirsute, but this character is not constant throughout the genus, e. g., *B. reclinata*. Although the ovary bears five anatropous ovules (one in each locule), it is seldom that more than one develops.

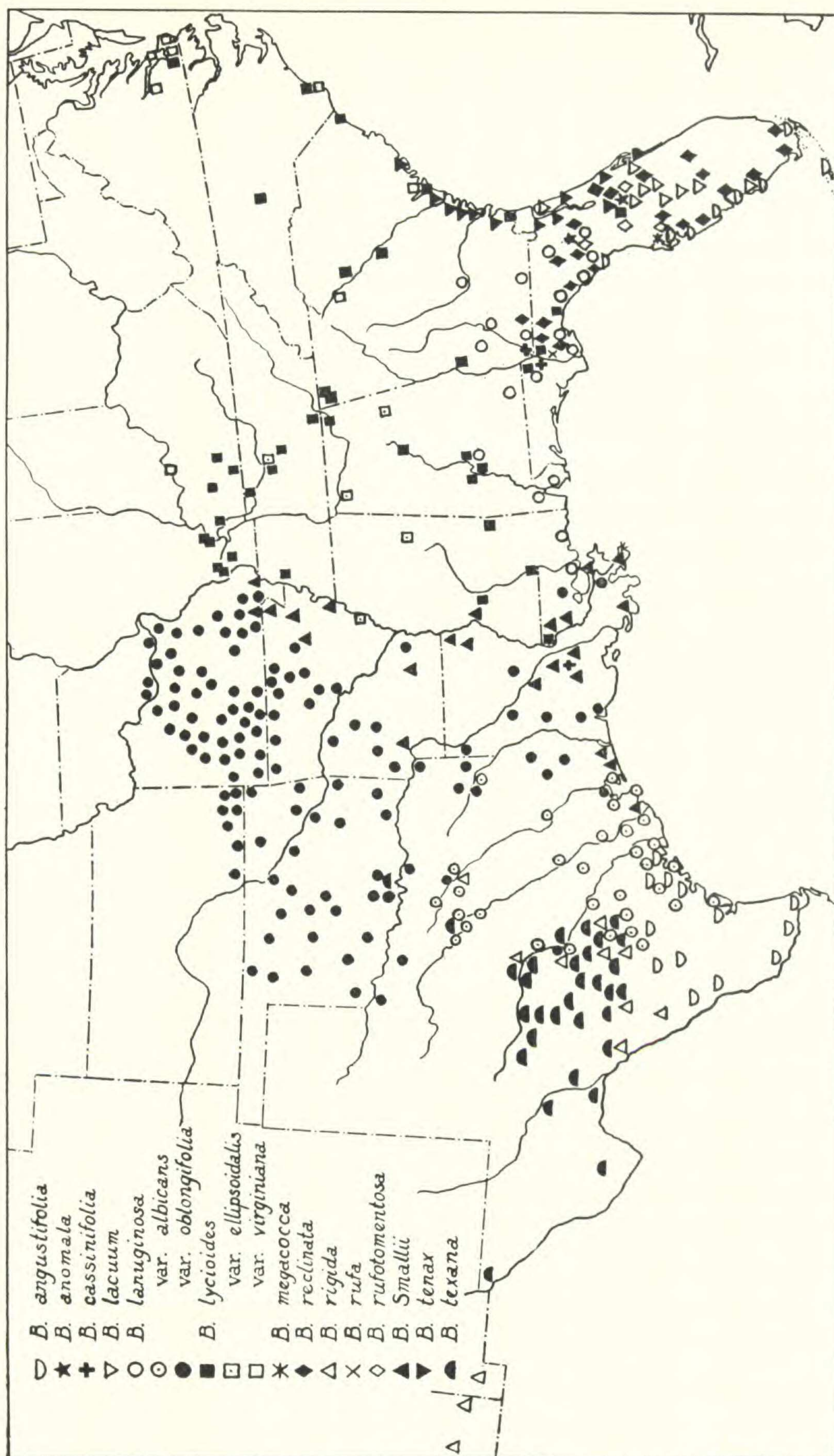
Fruit: The fruit is a single-seeded berry, enclosed in the fleshy wall of the ovary and often tipped by the persistent style. The berries are rather small, generally purplish-black when ripe, and edible.

Seed: The seeds are small with a hard, shiny, and oily testa which is generally brown though sometimes becoming variegated. The embryo is large, filling the cavity, while the radicle is barely evident; the cotyledons are thick, fleshy, usually consolidated, and albumen is wanting.

GEOGRAPHICAL DISTRIBUTION

Bumelia proves to be not only the hardiest genus of the Sapotaceae but also the most extensive. It ranges from the southeastern section of the country as far north as central Missouri and as far west as southeastern Arizona. The region of greatest diversity of species is centered in Florida, where eleven species occur, five being endemic. The greatest diversity of habitat is in Texas, where one species may be found growing in moist woodlands, while another inhabits only dry, sandy situations.

There are three natural groups of *Bumelia* in the United States. The first group consists of those species with lanuginose or sericeous pubescence on the branchlets, the under-surface of the leaves, the petioles, and the inflorescence, and includes *B. lanuginosa*, *B. tenax*, *B. lacuum*, *B. rigida*, etc. Except for the xerophytic species *B. rigida*, which occurs from southern Texas to southeastern Arizona, members of this group are chiefly mesophytic and inhabit sandy uplands, though not far removed from a source of water.

Map showing distribution of species of *Bumelia* throughout the United States.

They range from coastal South Carolina westward to southeastern Arizona, their distribution being interrupted by the lower Mississippi River Valley. Most widespread of these species is *B. lanuginosa*, which occurs in southern Georgia with two varieties extending from central Missouri to east-central Texas.

The second group is characterized by a tomentulose evanescent pubescence, and comprises such species as *B. lycioides*, *B. Smallii*, *B. reclinata*, etc. This group, except for *B. texana* which is found in the mountains or the dry, rocky plains of the Southwest, frequents more moist localities, occurring in the lower Mississippi River Valley, the Gulf and Atlantic coastal regions, and along water-courses as far north as southern Illinois and southeastern Virginia.

The third group is entirely glabrous or with only a few scattered hairs, and in this country *B. angustifolia* is its only representative. Plants of this species abound in the lower Rio Grande Valley of southern Texas, and are again found on the Keys and Gulf coast of Florida.

ACKNOWLEDGMENTS

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A—Arnold Arboretum, Harvard University.

G—Gray Herbarium, Harvard University.

L—Louisiana State University.

M—Missouri Botanical Garden.

NY—New York Botanical Garden.

P—Academy of Natural Sciences of Philadelphia.

Tr—S. M. Tracy Herbarium, Texas Agricultural Experiment Station.

Tu—Tulane University.

UO—University of Oklahoma.

US—United States National Herbarium.

UT—University of Texas.

TAXONOMY

Bumelia⁵ Sw. Prodr. Veg. Ind. Occ. 49. 1788; Benth. & Hook. Gen. Pl. 2: 660. 1876; Engler & Prantl, Nat. Pflanzenfam. 4¹: 145. 1891; Sarg. Silva 5: 167. 1893.

Lycioides L. Hort. Cliff. 488. 1738.

Robertia Scop. Introd. Hist. Nat. 154. 1777.

Sclerocladus Raf. Sylva Tellur. 35. 1838.

Sclerozus Raf. Aut. Bot. 2: 73. 1840.

Lyciodes O. Ktze. Rev. Gen. 2: 406. 1891.

Shrubs or small trees frequently with milky sap and spinescent branches. Leaves alternate or often fasciculate, simple, obovate to elliptic, entire, penninerved, short-petiolate, pubescent or glabrous beneath, usually coriaceous, deciduous or persistent. Flowers small, on rather short pedicels from the axils of scarious bracts, in many-flowered clusters from leaf-axils or from leafless nodes of the previous year, hermaphrodite, pentamerous, actinomorphic, hypogynous, proterogynous; calyx with 5 dimorphic, free sepals which are imbricate in aestivation and decurrent on the pedicel, persistent; corolla whitish, sympetalous, forming a short tube, the 5 lobes with pairs of lateral appendages; stamens epipetalous, 10 in 2 isomerous whorls—the fertile cycle opposite and equal in length to the corolla-lobes, the alternipetalous one reduced to petaloid staminodia; ovary 5-celled, generally hirsute, gradually or abruptly contracted into a filiform style stigmatic at apex, each locule with a solitary, anatropous ovule from the base of an axile placenta. Fruit a berry, oblong-ellipsoid or subglobose, blackish, often tipped by a persistent style; seed solitary with crustaceous, smooth, shiny, brownish testa, without albumen; embryo large, filling the cavity; cotyledons thick and fleshy.

Bumelia is confined to the New World, where it is distributed from central United States southward to Mexico, Central America, the West Indies, and South America as far as northern Argentina. Of the 35–40 species, 14 are found in the United States.

TYPE SPECIES: *Bumelia retusa* Sw. Prodr. Veg. Ind. Occ. 49. 1788.

KEY TO THE SPECIES

- A. Branchlets (except in *B. anomala*), petioles, lower surface of leaves, and inflorescence conspicuously pubescent.
- B. Pubescence woolly and lusterless.

⁵ Internat. Bot. Kongr. in Wien, Verhandl. No. 6374 in list of Nomina Conservanda. Jena, 1906.

- C. Leaves 2-10 cm. long, 1-4 cm. broad; flowers rather numerous.
 - D. Pubescence dense, rusty-tomentose; pedicels slender; seed oblong-obovoid, variegated.....1. *B. lanuginosa*
 - DD. Pubescence dense, whitish-tomentose; pedicels slender; seed ellipsoid, brown.....1a. var. *albicans*
 - DDD. Pubescence sparser than in species, whitish becoming tawny; pedicels stoutish; seed obovoid, brown.....1b. var. *oblongifolia*
 - CC. Leaves 1-4 cm. long, 0.5-1.5 cm. broad; flowers few.....2. *B. rigida*
 - BB. Pubescence sericeous and shiny.
 - C. Branches stout and spiny; leaves often small, not more than 4 cm. long; pubescence rufous.
 - D. Branchlets and lower surface of leaves densely tomentose; fruit obovoid, 8-10 mm. long.....3. *B. lacuum*
 - DD. Branchlets densely tomentose, lower surface of leaves hairy only on midrib and veins; fruit subglobose, 4-6 mm. long.....4. *B. rufotomentosa*
 - CC. Branches slender and nearly spineless; leaves rather large, usually more than 4 cm. long; pubescence silvery-white to tawny.
 - D. Leaves oblong-obovate to oblanceolate, cuneate at base; pedicels extremely slender, 8-13 mm. long.....5. *B. tenax*
 - DD. Leaves oblong-obovate to elliptic, obtuse at base; pedicels stout, 3-5 mm. long.
 - E. Branchlets glabrous, pale yellowish-gray; leaves shiny and pale green above, silvery beneath.....6. *B. anomala*
 - EE. Branchlets very tomentose, red or reddish-brown; leaves dull and dark green above, tawny beneath.....7. *B. rufa*
 - AA. Branchlets, petioles, lower surface of leaves, and inflorescence with few inconspicuous hairs generally scattered along midrib; or entirely glabrous.
 - B. Leaves puberulous or glabrate; fruit obovoid or subglobose (except in *B. lycioides* var. *ellipsoidalis*).
 - C. Leaves elliptic, generally broadest at middle.
 - D. Leaves 1.5-13.5 cm. long, obtuse to acuminate at apex (except var. *virginiana*) 8. *B. lycioides*
 - E. Leaves rounded at apex; corolla-tube shorter than in species; fruit obovoid.....8a. var. *virginiana*
 - EE. Leaves acute to acuminate at apex; corolla-tube same length as in species; fruit ellipsoid.....8b. var. *ellipsoidalis*
 - DD. Leaves 2-5 cm. long, acute to occasionally rounded at apex.....9. *B. Smallii*
 - CC. Leaves obovate or spatulate, mainly broadest above middle.
 - D. Leaves thinnish; corolla-lobes erose; seed usually not variegated.
 - E. Fruit 4-6 mm. long; seed occasionally variegated; ovary glabrous 10. *B. reclinata*
 - EE. Fruit 8-12 mm. long; seed not variegated; ovary hirsute.....11. *B. cassinifolia*
 - DD. Leaves coriaceous; corolla-lobes entire; seed variegated.
 - E. Leaves 1-7 cm. long; fruit obovoid, 8-10 mm. long.....12. *B. texana*
 - EE. Leaves 1-3.5 cm. long; fruit subglobose, 10-13 mm. long.....13. *B. megacocca*
 - BB. Leaves glabrous; fruit ellipsoid-cylindrical.....14. *B. angustifolia*

1. *Bumelia lanuginosa* (Michx.) Pers. Syn. 1: 237. 1805; DC. Prodr. 8: 190. 1844; Nutt. Sylva 3: 36. 1849; Sarg. Silva 5: 171, pl. 247. 1893, *pro parte*.

Sideroxylon tenax Walt. Fl. Car. 100. 1788, non L.

Sideroxylon lanuginosum Michx. Fl. Bor. Am. 1: 122. 1803.

? *Chrysophyllum ludovicianum* Raf. Fl. Ludovic. 53. 1817.

Lyciodes lanuginosum O. Ktz. Rev. Gen. 2: 406. 1891.

Shrub or small tree, 3–7 m. high; branchlets, petioles, lower surface of leaves, and inflorescence covered with lusterless tomentum at first pale, becoming reddish-brown; stems with reddish-gray bark, armed occasionally with short stout spines; leaves narrowly oblong-obovate, rarely elliptic, 2–10 cm. long, 1–4 cm. broad, round to acute or sometimes mucronate at apex, cuneate at base, dark green and lustrous above, thin and firm at maturity; petioles 2–15 mm. long; flowers disposed in few- to many-flowered fascicles; pedicels 8–12 mm. long, greatly enlarged towards apex; sepals broadly obovate to suborbicular, rounded at apex; corolla-lobes broadly ovate to elliptic, appendages ovate-lanceolate, acute; stam-inodia ovate-elliptic, obtuse at apex, erose, nearly as long as the petals; fruit purplish-black, oblong-ellipsoid, 6–10 mm. long, frequently tipped by a persistent style; seed oblong-obovoid, 5–8 mm. long, variegated tan and brown.

Distribution: in sandy uplands and along streams, southwestern Georgia and adjacent Florida, westward to southeastern Louisiana.

Specimens examined:

GEORGIA: precise data lacking, *Michaux s.n.* (Mus. Paris, TYPE; G, fragment). DECATUR Co.: near Bainbridge: *Curtiss 1762*, in part (A), *Harbison 15, 1127* (A). DOUGHERTY Co.: along Flint R. at Albany: May 24–28, 1895, *Small* (A), *Harbison 14* (A); Dr. Gillespie's Pocason Place, *Gillespie 4956* (A). RANDOLPH Co.: Cuthbert, *Harbison 6* (A). TELFAIR Co.: Lumber City, *Harbison 16* (A). TERRELL Co.: banks of Kinekafoonee Cr., *Harper 1153* (G, M).

FLORIDA: exact locality unknown, *Chapman* (G, M, P); "N.W. Fla.", *Curtiss 35* (G). ALACHUA Co.: Gainesville, *Seibert 1412, 1412a* (M). COLUMBIA Co.: Lake City: *Nash 2167* (A, G, M), *Wiegand & Manning 2486* (G). DIXIE Co.: Old Town, *Harbison 12* (A). FRANKLIN Co.: banks of Chattahoochee R., above Apalachicola: *Biltmore Hb. 1688*, coll. by Chapman (A, G, M), *Saurman* (P); Carrabelle, *Harbison 23, 27* (A). JACKSON Co.: Marianna: *Harbison 14, 29* (A), *Palmer 35301* (A, M, P). LEVY Co.: Cedar Keys, *Tracy 7464* (A, G, M). WAKULLA Co.: Wakulla Springs, *Harbison 1216* (A, M). TAYLOR Co.: Hampton Springs, *Palmer 38474* (A, M).

ALABAMA: locality not given: *Beck* (P), *Cabell* (G). BALDWIN Co.: Fairhope, *Jack 3026* (A); Perdido, *Mohr 47* (A). DALE Co.: near Ozark, *Palmer 38653* (A, M). DALLAS Co.: Selma, *Harbison 96, 829, 1095, 1111* (A). MOBILE Co.: Mt. Vernon, *Harbison 7* (A).

MISSISSIPPI: HARRISON Co.: Mississippi City, *Harbison 3* (A); Stabilized Beach, Cat Isl., Apr. 19, 1931, *Penfound* (Tu).

LOUISIANA: ST. TAMMANY Parish: Slidell, Aug. 1899, *Cocks* (A).

B. lanuginosa is limited in its distribution; it seems to be related to *B. tenax* but is distinguished by its sparser, woolly pubescence

(which in *B. tenax* is sericeous), its generally larger and broader leaves, and its fewer-flowered inflorescence.

1a. *Bumelia lanuginosa* var. *albicans* Sarg. in Jour. Arn. Arb. 2: 168. 1922.

Bumelia arborea Buckl. in Proc. Phil. Acad. **13**: 461. 1861.

Small tree to 20 m. high, with branches rarely armed; pubescence dense, whitish, lusterless, appressed at first, becoming woolly; leaves somewhat narrower than in species; petioles 5–15 mm. long; inflorescence many-flowered; pedicels slender, 5–13 mm. long; sepals reniform to elliptic; corolla-lobes oblong-elliptic; margins of appendages crenulate; staminodia oblong-elliptic, rounded and somewhat cucullate at apex; ovary subglobose, abruptly contracted into an elongated style; fruit ellipsoid to oblong-obovoid, 8–12 mm. long; seed ellipsoid, brown with tuberculate apex.

Distribution: in sandy river-bottoms and rocky uplands, east-central Texas, and adjacent Mexico.

Specimens examined:

TEXAS: "S. Tex.", *Buckley* (P, type of *B. arborea*, G, fragment). ATASCOSA Co.: s. of San Antonio on road to Corpus Christi, *Buckley* (A); Campbelton, *Palmer 11242* (M). BEXAR Co.: San Antonio: *Bush 802* (A, M), Hildebrandt Rd., *Clark & Parks 567* (M); Swearingen Ranch, *Schulz 49* (A). BOSQUE Co.: Meridian, June 29, 1927, *Tharp* (UT). BRAZORIA Co.: Brazos R., Brazoria, *Palmer 6741* (A, M); Columbia: *Bush 1, 2, 3, 210, 226, 877, 1427, 1524* (M), *Palmer 5050* (A); Velasco, *Palmer 13131* (A, M). BRAZOS Co.: Bryan, *Palmer 11739* (A, M); near Neleva, *Palmer 13446* (A, M). CALHOUN Co.: Indianola, *Cory 11618* (A); Wolf Pt., *Tharp 1431* (UT). CHAMBERS Co.: Apr. 8, 1936, *Tharp* (UT). COMAL Co.: Brazos R. bottoms, *Lindheimer 90* (M); New Braunfels, *Lindheimer 269*, in distribution as no. 979 (A, G, M, P, UO, UT). DALLAS Co.: Dallas: *Reverchon 384* (G), *590* (A, M), June 22, 1899, *Eggert* (M), Nov. 21, 1913, *Sudworth* (A). ERATH Co.: Stephenville, *Palmer 14176* (A, M). FT. BEND Co.: Brazos R., Richmond, *Palmer 4943* (A). GALVESTON Co.: Galveston Isl., May 1843, *Lindheimer* (M). GOLIAD Co.: Goliad: Apr. 8, 1900, *Eggert* (M), along San Antonio R., near La Bahia Mission, *Clark & Parks 574* (M). GONZALES Co.: Halff Ranch, Mar. 3, 1940, *Parks* (Tr); Ottine Swamp, *Cory 5770* (A). HARRIS Co.: Houston: June 1842, Aug. 1843, *Lindheimer* (M), June 16, 1903, *Reverchon* (M), June 4, 1915, *Fisher* (M), *Palmer 11456* (A, M). JACKSON Co.: E. Karankawa Pt., *Tharp 1424* (UT). LAMPASOS Co.: Lampasos, Mar. 21, 1911, *Sargent* (A). LLANO Co.: Enchanted Rock, June 11, 1930, *Tharp* (UT). MATAGORDA Co.: Peyton's Cr., *Palmer 9734* (A, M). NAVARRO Co.: Corsicana, *Reverchon 3194* (M); near Dawson, *Reverchon 3867* (M). NUECES Co.: Nuecestown, Apr. 27, 1896, *Marlatt* (US). PALO PINTO Co.: Strawn, *Palmer 14266* (A, M). RUSK Co.: Henderson, July 30, 1927, *Tharp* (UT). SAN SABA Co.: San Saba, *Palmer 11844* (A). SOMERVILLE Co.: Squaw Cr., above Glen Rose, Oct. 9, 1891, *Ward* (US). TARRANT Co.: Caddo Cr. bottoms, near Handley, Sept. 23, 1902, *Reverchon* (M); near Ft. Worth, *Ruth 202* (G, M, P). TRAVIS Co.: Austin: Apr. 1860, *Buckley* (M), *Mohr 12* (A), *Mohr 623* (US), Mar. 29, 1885, *Sargent* (A), *Schostag 3002* (UT), *McKee & Wesley 3834* (UT), *Parker 4791* (UT), N. Y. State College of Forestry, Proj. I, 8269, coll. by *Tharp* (A), *Schulz 2434* (A). VICTORIA Co.: Guadalupe R. bottoms, Victoria: Apr. 9, 1915, *Sargent* (A, TYPE), *Palmer 9104* (A, M).

WALKER Co.: Huntsville, *Dixon* 403 (G). WALLER Co.: Hempstead, *Hall* 394 (G, M). WHARTON Co.: banks of Colorado R., Wharton, *Palmer* 4902 (A). WILSON Co.: *Parks & Cory* 7791 (Tr); Sutherland Springs: Oct. 1910, *Mackenson* (A), Apr. 8, 1915, *Sargent* (A), *Palmer* 9209 (A, M), *Cutler* 858 (M).

MEXICO: NUEVO LEON: near Monterrey, Apr. 6, 1887, *Sargent* (A).

Tallest of the Bumelias in the United States, *B. lanuginosa* var. *albicans* is limited in distribution and is easily recognized by its rather dense, whitish pubescence.

1b. *Bumelia lanuginosa* var. *oblongifolia* (Nutt.) Clark, comb. nov.

Bumelia oblongifolia Nutt. Gen. 1: 135. 1818; Sylva 3: 33. 1849.

Bumelia arachnoidea Raf. New Fl. N. Am. 3: 28. 1836.

Bumelia tomentosa A. DC. in DC. Prodr. 8: 190. 1844.

Armed shrub or small tree; pubescence rather sparse, dull, whitish, becoming tawny; leaves obtuse to rounded or somewhat retuse at apex, broadly cuneate at base; petioles 2–10 mm. long; flowers numerous; pedicels 5–8 mm. long; sepals suborbicular to oblong-ovate or elliptic; corolla-lobes oblong-ovate; ovary subglobose, abruptly contracted into the style; fruit broadly elliptic-ovate; seed obovoid, brown.

Distribution: in dry, rocky uplands, southern Missouri and southeastern Kansas to Louisiana and eastern Texas.

Specimens examined:

MISSOURI: BARRY Co.: Eagle Rock: *Bush* 182, 3130 (M); Roaring R., *Trelease* 1117 (M). BENTON Co.: along Cole Camp Cr.: *Demetrio* 47 (G), *Trelease* 430 (M), *Palmer* 30067 (A, M); along Osage R.: near Fredonia, *Palmer* 35956 (A, M), near Warsaw, *Palmer* 36769 (A, M). BOONE Co.: Missouri R. bluffs above Wilton P. O., *Jeffrey* 307 (M). CALLAWAY Co.: along Stinson Cr., s.w. of Fulton, *Steyermark* 26076 (M). CARTER Co.: Club House, *Trelease* 427 (M); along Big Barren Cr., s.e. of Fremont, *Steyermark* 11888 (M). CEDAR Co.: along Sac R., n.e. of Stockton, *Steyermark* 13479 (M). CHRISTIAN Co.: Swan Cr., s.e. of Chadwick, *Steyermark* 22991 (M). COLE Co.: near Brazito, *Palmer* 39227 (A, M); near Jefferson City, *Palmer* 39231 (A). COOPER Co.: *Bush* 13654, 13893 (A). DADE Co.: near Turnback, *Palmer* 35595 (A, M). DALLAS Co.: along Niangua R., s. of Windyville, *Steyermark* 13737 (M). DOUGLAS Co.: between Roosevelt and Richville, *Steyermark* 14693 (M). FRANKLIN Co.: July-Aug. 1835, *Meyer* (M); Catawissa, July 26, 1887, *Eggert* (G, M); Pacific, *Greenman* 3898 (M); along Meramec R., Meramec State Pk., Sullivan, *Steyermark* 1492 (M). GREENE Co.: near Springfield, *Palmer* 30148 (A, M). HENRY Co.: along Grand R., n.e. of Finey, *Steyermark* 15964 (M). HICKORY Co.: along Pomme de Terre R., near Hermitage, *Palmer* 35983 (A, M). IRON Co.: near Iron-ton, *Palmer* 22642 (A). JASPER Co.: Carterville, *Palmer* 2655, 18318 (A); Carthage, *Bush* 10390 (A, G, M); Muddy Cr., Golden City, *Palmer* 4585 (A, M); near Jasper, *Palmer* 28931 (A, M); near Joplin: *Trelease* 433 (M), *Palmer* 22730, 23366, 26316 (A); Neck, *Palmer* 15723 (A); Spring R., *Trelease* 1116 (M); near Waco, *Palmer* 18483 (A); Webb City, *Palmer* 28, 927, 14291 (M). JEFFERSON Co.: De Soto, July 25, 1887, *Hasse* (M); s.e. of Pacific, *Steyermark* 1270 (M); Victoria, May 10 and July 8, 1890, *Hitchcock* (M).

LAWRENCE Co.: near Red Oak, *Palmer* 26980 (A, M). MADISON Co.: near Fredericktown, *Palmer* 31622, 31639 (A). MARIES Co.: Lanes Prairie, *Bush* 13470 (A). McDONALD Co.: *Bush* 236 (G, M); Noel: *Bush* 4978, *Palmer* 4264, 5491, 14660, 14664 (A, M). MILLER Co.: Bagnell, *Trelease* 426 (M); near Tuscumbia, *Palmer* 39220 (A, M). MONITEAU Co.: between California and Jamestown, *Steyermark* 14758 (M). MORGAN Co.: *Bush* 13596, 13691 (A, M); along Proctor Cr., *Steyermark* 13181 (M). OSAGE Co.: along Maries R., w. of Westphalia, July 14, 1933, *Jeffrey* (A). OZARK Co.: near Bakersfield, *Palmer* 32819 (A, M); "Bald Jesse" near Gainesville, *Palmer* 34761 (A, M). PETTIS Co.: *Bush* 13628 (A, M). PHELPS Co.: "Slaughter Sink" near Arlington, *Palmer & Steyermark* 41399 (A, M); Jerome, *Kellogg* 388 (A, M). POLK Co.: along Pomme de Terre R.: n. of Burns, *Steyermark* 13630 (M), Buzzards Den, n.w. of Pleasant Hope, *Steyermark* 24108 (M). PULASKI Co.: Big Piney R., *Trelease* 429 (M). RIPLEY Co.: Bay Mills, *Mackenzie* 392 (M). ST. CHARLES Co.: Meramec R. at St. Pauls, 25 mi. w. of St. Louis, Nov. 2, 1854, *Engelmann* (G, M). ST. CLAIR Co.: along Osage R.: near Osceola, *Palmer* 35646 (A, M, P), n. of Oyer, *Steyermark* 20237 (M). ST. FRANCOIS Co.: Bismarck, *Palmer* 18055 (A, M); Flat River, *Trelease* 431, 432 (M). ST. LOUIS Co.: July 26, 1886, *Eggert* (A, US); Allenton: 1876-1911, *Letterman* (M, P, US), July 29, 1887, *Eggert* (M); Big Bend, Meramec R., ex *Glatfelter Hb.* 308 (M); near Glencoe and Valley Park, July 18, 1879, *Eggert* (M); Meramec Highlands: 1874, *Letterman* (M), July 28 and Sept. 6, 1886, *Eggert* (M, UT), June 25, 1904, *Gleason* (G), *Bartram* 2425 (P); Pleasant Grove, *Bush* 262 (M). SHANNON Co.: *Bush* 956 (M); Montier: *Bush* 171, 704, 1138 (M), *Palmer* 19390 (A, M). STODDARD Co.: n. of Puxico, *Steyermark* 11641 (M). STONE Co.: near Galena: *Palmer* 4641, 5772, 5860, 5862, 14360, 22860, 24601, 26136 (A); "White Rock Bluff," White R., *Palmer* 5857 (A, M). TANEY Co.: Swan Cr., *Trelease* 428 (M). WASHINGTON Co.: near Irondale, *Palmer* 30172 (A, M). WAYNE Co.: Williamsville, *Palmer* 6113 (A, M). WEBSTER Co.: headwaters of James R., *Engelmann* 53 (M); near Niangua, *Palmer* 39504 (A, M, P). WRIGHT Co.: *Bush* 905 (M).

ARKANSAS: complete data lacking, *Nuttall s.n.* (P, TYPE), June 7, 1854, *Beyrich* (M). BENTON Co.: Twin Mt. and Osage R., *Demaree* 4563, 4614 (M); near Monte Ne, *Palmer* 24749 (A, M). BOONE Co.: Harrison, *Palmer* 6917 (A). CARROLL Co.: Beaver, *Palmer* 6330 (A, M); near Eureka Springs, *Palmer* 20472 (A). CLARK Co.: Amity, *Demaree* 10017 (M); Arkadelphia, *Palmer* 10536 (A); Okolona, *Demaree* 16100 (M). DREW Co.: Tillar, *Demaree* 19281 (M). FAULKNER Co.: *Demaree* 99 (M); Mammoth Springs, *Demaree* 5294 (M). GARLAND Co.: near Hot Springs, *Palmer* 23083, 29075 (A, M). HOT SPRINGS Co.: Magnet Cave, *Palmer* 26565 (A). IZARD Co.: along White R., near Calico Rock, *Palmer* 35553 (A, M). JACKSON Co.: Newport: May 5, 1881, *Letterman* (A, M), *Palmer* 35533 (A, M). LOGAN Co.: Magazine Mt., *Palmer* 24165 (A, M). MARION Co.: bluffs of White R., Cotter, *Palmer* 5915, 14328 (M). MONTGOMERY Co.: bottoms of Caddo Cr., Norman, *Demaree* 9561 (M). POPE Co.: near Nogo, *Merrill* 88 (A, M, NY). PULASKI Co.: Little Rock: 1880, *Harvey* (M), banks of Arkansas R., *Palmer* 22929 (A, M); Palarm, *Demaree* 8716 (A); Maumelle Mt., Pinnacle, *Palmer* 23015 (A). SALINE Co.: banks of Saline R., near Benton, *Demaree* 8496 (A). SEVIER Co.: Horatio, *Palmer* 8389 (A, M). VAN BUREN Co.: near Shirley, *Palmer* 24314 (A, M).

LOUISIANA: exact locality lacking, *Hale* (G, P). CADDO Parish: Shreveport, July 1909, *Dickson* (Tu). CALCASIEU Parish: Lake Charles: Apr. 13, 1915, *Sargent* (A), *Palmer* 7699 (A, M). CAMERON Parish: Cameron, *Palmer* 8536 (A, M). LA SALLE Parish: Standard, Sept. 1, 1927, *Whitehead* (L). NATCHITOCHES Parish: Natchitoches, *Palmer* 7468, 8022, 8763 (A, M). ORLEANS Parish: New Orleans, 1832, *Drummond* 207, in part (G, co-type of *B. tomentosa*). TANGIPAHOA Parish: Hammond, May 1910, *Cocks* (Tu). VERNON Parish: Leesville, *Brown* 6869, 6872 (L).

KANSAS: CHAUTAUQUA Co.: along Middle Caney Cr., near Sedan, *Palmer* 41809 (A, M). CHEROKEE Co.: *Black* 757 (G, M); near Galena, *Palmer* 20884, 21982, 25339 (A). COWLEY

Co.: Arkansas City, *Palmer 21244, 22072* (A). CRAWFORD Co.: near Pittsburg, *Palmer 20826* (A). LA BETTE Co.: w. of Oswego, *Rydberg & Imler 317* (M). NEOSHO Co.: Ladore, Nov. 15, 1893, *Hart* (P). WILSON Co.: near Neodesha, *Palmer 21160, 22030* (A).

OKLAHOMA: BLAINE Co.: Canton, *Andrews 20* (A). CANADIAN Co.: Devils Canyon, e. of Hinton: *Little 3911* (A, UO), *Hopkins 2108* (UO). CHEROKEE Co.: e. of Tahlequah, *Little 477* (UO). CHOCTAW Co.: Ft. Towson, *Palmer 8308* (A, M). CLEVELAND Co.: near Norman: Aug. 20, 1924, *Braner* (A, US), *Felkner 11* (UO), *Stacy 107* (UO). COMANCHE Co.: Boulder Camp, Wichita Nat. Forest, *Demaree 13180* (UO). CUSTER Co.: Clinton, *Palmer 12559* (A, M). GARFIELD Co.: n.w. of Enid, *Brigham 11* (UO). GREER Co.: s.e. of Granite, *Bull 248* (UO). JOHNSON Co.: Tishomingo, *Palmer 6416* (A, M). KIOWA Co.: near Mountain Pk., *Stevens 1261½* (A, G). LE FLORE Co.: near Page: *Stevens 2628* (A, G), *Palmer 20556* (A); Poteau, *Palmer 8266, 8267* (A, M). MAJOR Co.: Cleo, *Stevens 1720* (G, M). McCURTIN Co.: s. of Bethel, *Hopkins & Cross 2543* (UO). McLAIN Co.: w. of Purcell, *Hopkins 1187* (UO). MURRAY Co.: Arbuckle Mts., *Hopkins 2750* (UO); Davis, *Emig 658* (M); Platte Nat. Pk., near Sulphur, *Merrill 908* (A), *1724* (M). MUSKOGEE Co.: Muskogee, *Palmer 11198* (A, M). OKLAHOMA Co.: Oklahoma City, *Palmer 14610, 22107* (A). OTTAWA Co.: Commerce, *Bush 9266, 10148* (A). PAYNE Co.: near Perkins, Oct. 3, 1896, *Bogue* (P); s.w. of Stillwater, *Spears 113* (UO). ROGER MILLS Co.: near Antelope Hills, *Bigelow 678* (G). TULSA Co.: along Arkansas R., *Bush 491* (A, G, M); near Fisher, *Stevens 2960-E* (G). WASHINGTON Co.: Copan, *Stevens 2154* (A, G). WOODS Co.: s.w. of Waynoka, *Jackson 340* (UO). WOODWARD Co.: near Woodward, *Palmer 41927* (A, M).

TEXAS: ANGELINA Co.: Pine Island, May 5, 1903, *Reverchon* (M); Jack Cr., July 25, and Haw Cr., Aug. 12, 1934, *Boon* (UT). ARCHER Co.: Diversion Lake, *Cory 13227* (A). BOWIE Co.: near Texarkana, *Heller & Heller 4242* (A, M, NY, US). GREGG Co.: n. of Longview, June 7, 1899, *Eggert* (M). DALLAS Co.: Dallas, *Bush 1619* (A, M). GRAYSON Co.: Denison, *Palmer 14273* (A, M). HARDEMAN Co.: n. of Chillicothe, *Parks & Cory 13368* (Tr), *Cory 13369* (A). HARRIS Co.: Houston, *Palmer 11927* (A, M). HARRISON Co.: Marshall, *Palmer 13226* (A, M). LLANO Co.: Enchanted Rock, Sept. 1, 1930, *Whitehouse* (UT). POLK Co.: Livingston, *Palmer 5262* (A, M). RUSK Co.: Tatum, Oct. 10, 1902, *Reverchon* (M). SAN AUGUSTINE Co.: San Augustine, *Palmer 7892, 7894* (A, M).

The most widespread element in the *B. lanuginosa* complex, var. *oblongifolia* differs from the species in its rather sparse pubescence and shorter pedicels.

2. *Bumelia rigida* (Gray) Small in Bull. N. Y. Bot. Gard. **1**: 444. 1900; Britt. N. Am. Trees, 780, *fig. 711*. 1908; Wooton & Standl. in Contrib. U. S. Nat. Herb. **19**: 495. 1915.

Bumelia spinosa S. Wats. in Proc. Am. Acad. **18**: 112. 1883, non A. DC.

Bumelia lanuginosa var. *rigida* Gray, Syn. Fl. N. Am., ed. 2, **2**¹: 68. 1886.

Bumelia pauciflora Engelm. ex Gray, Syn. Fl. N. Am., ed. 2, **2**¹: 68. 1886, non Roem. & Schult.

Armed shrub or small tree, 6–8 m. tall; branches numerous, short, spinescent, clothed in reddish or grayish bark; branchlets, lower surface of leaves, petioles, and inflorescence densely covered with

pale tomentum; leaves numerous, coriaceous, small, obovate to cuneate-oblongate, 1–4 cm. long, 0.5–1.5 cm. broad; flowers few; pedicels stout, 2–5 mm. long; sepals oblong-elliptic to suborbicular; corolla-lobes suborbicular, truncate at base, margins erose; appendages lanceolate to ovate-lanceolate, acute at apex, margins erose; staminodia ovate-lanceolate, obtuse at apex, margins erose; ovary cylindrical, abruptly contracted into a slender, elongated style; fruit obovoid to subglobose, 6–9 mm. long, purplish-black, short style often persistent; seed obovoid to subglobose, 3–6 mm. long, frequently narrowed at base, variegated, dark brown and pale tan.

Distribution: near streams on dry, gravelly mountain slopes, south-central Texas, westward to southeastern Arizona, and adjacent Mexico.

Specimens examined:

TEXAS: BEXAR Co.: San Antonio, *Clemens & Clemens 889* (M). DUVAL Co.: San Diego, Apr. 1882, *Buckley* (A). KERR Co.: Lacey's Ranch, *Schulz 36* (US). LLANO Co.: Harris, *Parks & Cory 6271* (Tr). NUECES Co.: Corpus Christi, Mar. 26, 1907, *York* (UT). UVALDE Co.: Uvalde, July 1879, *Edw. Palmer 156* (G, TYPE, US). VALVERDE Co.: Devils R., *Palmer 11367* (A, M).

NEW MEXICO: Dier Cr., June 20, 1906, *Wootton* (US); Dog Spring, Dog Mts., *Mearns 2351, 2356* (US); San Bernardino R., *Mearns 2545* (US). HIDALGO Co.: Animas Valley, s. of Animas, *Wolf 2580* (G).

ARIZONA: COCHISE Co.: Camp Bowie, *Lemmon 200* (G); Guadalupe Canyon, e. of Douglas, *Peebles 11698* (US); Ft. Bowie: June 25, 1894, *Fisher* (US), *Blumer 2298* (NY); near Gleeson, *Shreve 5382* (A, G, US); Chiricahua Mts., near Paradise: *McKelvey 605* (A, US), Turkey Cr., May 27, 1906, *Holmes* (US), Whitetail Cr., Dec. 1908, *Sudworth* (US); Swisshelm Mts., July 21, 1894, *Toumey* (A, NY). PIMA Co.: Santa Catalina Mts., June 16, 1881, *Pringle s.n.* (M, type of *B. pauciflora*, A, G, US); Bear Cr., Tucson, *Eastwood 8164* (A); Baboquivari Canyon, *Peebles, Harrison & Kearney 388* (US).

MEXICO: COAHUILA: Saltillo, *Palmer 232* (A).

B. rigida seems to be composed of two elements. One of these may possibly be a variety of *B. lanuginosa* that has adapted itself to the conditions of soil and climate of the Southwest: in its pubescence it resembles *B. lanuginosa* var. *albicans*, while in its fruit and pedicels it looks like *B. texana*. However, it seems advisable not to attempt any segregation until more material is available.

3. *Bumelia lacuum* Small, Man. S. E. Fl. 1034. 1933.

Armed evergreen shrub, 0.5–3 m. tall; branchlets, petioles, lower surface of leaves, and inflorescence densely covered with lustrous, appressed, rufous pubescence; leaves oblong-obovate to spatulate, 1–4 cm. long, 1–3 cm. broad, obtuse at apex, cuneate at base, mar-

gins slightly revolute; petioles 1–4 mm. long; sepals and corolla-lobes oblong-elliptic; corolla-tube short, lobes scarious, appendages ovate-lanceolate, acute at apex; staminodia ovate-elliptic, obtuse at apex, margins slightly crenulate; ovary subglobose, abruptly contracted into the style; fruit oblong- to elliptic-obovoid, 8–10 mm. long; seed elliptic-obovoid, 6–8 mm. long, pale tan.

Distribution: sandhills, usually in scrub, central peninsular Florida.

Specimens examined:

FLORIDA: exact locality unknown, *Rugel* 161 (M); “E. Fla.”, *Buckley* (G). BREVARD Co.: Indian R., *Palmer* 326 (G, M). COLLIER Co.: Caxambas Isl., *Simpson* 578 (G). COLUMBIA Co.: Lake City, *Rolfs* 46 (M). DUVAL Co.: near Jacksonville, *Curtiss* 1762' (M). HIGHLANDS Co.: between Avon Park and Sebring: *Small & DeWinkeler* 9042 (NY), Aug. 30–31, 1922, *Small*, *Small & DeWinkeler* 10666^a (NY, fr. part of TYPE), 10755 (NY); n. of Kuhlman, Apr. 25, 1921, *Small & DeWinkeler* 9965 (NY, fl. part of TYPE, G); near Sebring: *Harbison* 29, 37 (A), *Palmer* 27438 (A, M). LAKE Co.: near Eustis: *Hitchcock* (M), *Nash* 818 (A, G, M, NY), *Harbison* 9 (A). ORANGE Co.: e. of Maitland, *Baker* 513 (A); edge of L. Apopka hammock, w. of McDonald, *Baker* 504, 505, 506, 507, 508, 509, 510, 511a,b,z, 512a,b,z, 514, 515, 525, 544 (A); near Plymouth, *Palmer* 38350 (A, M). OSCEOLA Co.: Kissimmee, Aug. 2, 1929, *O'Neill* (US). POLK Co.: near Bartow, *Palmer* 38366 (A), near Frostproof, *Palmer* 27385 (A); Winter Haven, *McFarlin* 6678 (UT). SEMINOLE Co.: Oviedo, *Harbison* 8, 9 (A).

B. lacuum is segregated from *B. tenax* because of its dwarfness. Also the pubescence is rufous and less lustrous.

4. *Bumelia rufotomentosa* Small in Bull. N. Y. Bot. Gard. 1: 440. 1900, as *rufomentosa*; Man. S. E. Fl. 1033. 1933.

Armed shrub less than 1 m. high; branchlets and petioles densely covered with rufous tomentum; leaves coriaceous, obovate or oval, 1.5–4 cm. long, 0.5–3 cm. broad, rounded to slightly retuse at apex, cuneate at base, sparingly pubescent beneath; petioles very short, 1–3 mm. long; flowers few; pedicels 3–5 mm. long; sepals oblong-elliptic to suborbicular; corolla-lobes suborbicular, appendages ovate-lanceolate, obtuse at apex; staminodia ovate, acute at apex; ovary subglobose, gradually contracted into a stout style; fruit subglobose, 4–6 mm. in diameter.

Distribution: in pine woods, peninsular Florida.

Specimens examined:

FLORIDA: ALACHUA Co.: Gainesville, *Seibert* 1411 (M). HILLSBOROUGH Co.: Tampa, May 1876, *Garber* (NY, TYPE, US). ORANGE Co.: Zellwood, *Baker* 503a,b,c,z (A). SUMTER Co.: Sumterville, *Curtiss* 1764 (A, G).

^a *Small, Small & DeWinkeler* 10666 distributed as “*Bumelia tenax* Willd.” is apparently *Dipholis salicifolia* (L.) DC.

This species is possibly a pubescent form of *B. reclinata*, but it is recognized here as a separate species because of its rufous-tomentose branchlets and its villous ovary.

5. ***Bumelia tenax*** (L) Willd. in L. Sp. Pl. 1²: 1085. 1798; Loud. Arb. & Frut. Brit. 2: 1193, *fig. 1017*. 1838; DC. Prodr. 8: 190. 1844; Nutt. Sylva 3: 35, *pl. 92*. 1849; Sarg. Silva 5: 169, *pl. 246*. 1893; Small in Bull. N. Y. Bot. Gard. 1: 446. 1900.

Sideroxylon tenax L. Mant. 48. 1767, non Walt.

Chrysophyllum carolinense Jacq. Obs. 3: 3, *pl. 54*. 1768.

Sideroxylon sericeum Walt. Fl. Car. 100. 1788.

Sideroxylon chrysophylloides Michx. Fl. Bor. Am. 1: 123. 1803.

Bumelia chrysophylloides Pursh, Fl. Am. Sept. 1: 155. 1814; P. W. Wats. Dendr. Brit. 1: 10, *pl. 10*. 1825.

Sclerocladus tenax Raf. Sylva Tellur. 35. 1838.

Sclerozus tenax Raf. Aut. Bot. 2: 73. 1840.

Bumelia reclinata Chapm. Fl. Southeast. U. S. 275. 1860, non Vent. nec Torr.

Lyciodes tenax O. Ktz. Rev. Gen. 2: 406. 1891.

Shrub or small tree, 2–10 m. high; branchlets, petioles, lower surface of leaves and inflorescence densely covered with a tawny pubescence; branchlets slender, with reddish-brown bark, occasionally armed with stout spines, 2–2.5 cm. long; leaves oblong-obovate to oblanceolate, 2–7 cm. long, 0.5–3.5 cm. broad, obtuse at apex, cuneate at base, margins slightly revolute, midvein prominent; petioles 2–9 mm. long; inflorescence many-flowered; pedicels slender, 8–13 mm. long, slightly enlarged toward apex; sepals oblong-obovate to subglobose; corolla-lobes oblong-elliptic to subglobose, margins erose, appendages lanceolate, acute at apex, crenulate; staminodia broadly ovate, obtuse to rounded at apex, margins erose; ovary narrowly ovoid, gradually contracted into an elongated style; fruit oblong-ellipsoid, 10–14 mm. long, often tipped by a persistent style; seed oblong-obovoid, 10–12 mm. long, apex tuberculate, variegated.

Distribution: dry, sandy soil along sea-coast, South Carolina to Florida.

Specimens examined:

CAROLINA: precise data lacking, *Walter s.n.* (G, fragment of type of *Sideroxylon sericeum*).

SOUTH CAROLINA: BEAUFORT Co.: Bluffton, 1871–99, *Mellichamp* (A, G, M); St. Helena Isl., *Harbison 10* (A). CHARLESTON Co.: Sullivan Isl., *Ravenel* (G).

GEORGIA: CHATHAM Co.: near Savannah, *Beyrich* (P). GLYNN Co.: Brunswick, *Harbi-*

son 4, 5, 1222 (A). LIBERTY Co.: Colonels Isl., *Harbison* 26 (A); St. Catherines Isl., *Harbison* 9, 10 (A). MCINTOSH Co.: *Harbison* 2, 3, 4 (A).

FLORIDA: exact locality unknown, *Rugel* 320 (M). BREVARD Co.: along Indian R., Tropic, Merritts Isl., *N. Y. State College of Forestry, Proj. I, 8334*, coll. by Rhoads (A). CLAY Co.: Magnolia Springs, *Harbison* 7051a (A). DUVAL Co.: *Fredholm* 5345 (G); near Jacksonville, *Curtiss* 1762, in part, 4362, 5678 (M). LAKE Co.: Eustis, *Nash* 1662 (A, P). ST. JOHNS Co.: near Matanzas, *Harbison* 6 (A). VOLUSIA Co.: Seabreeze, *Webber* 467 (M).

B. tenax is a coastal species characterized by dense, tawny sericeous pubescence.

6. *Bumelia anomala* (Sarg.) Clark, comb. nov.

Bumelia lanuginosa var. *anomala* Sarg. in Jour. Arn. Arb. **2**: 169. 1922.

Small tree; branches glabrous, armed with occasional stout spines, bark yellowish-gray; leaves coriaceous, oblong-obovate to broadly elliptic, 1.5–6.5 cm. long, 1–3 cm. broad, rounded to obtuse at apex, obtuse at base, lower surface densely covered with lustrous, appressed, silvery pubescence, margins slightly revolute; petioles 2–6 mm. long; inflorescence few-flowered; pedicels 3–5 mm. long, slightly enlarged toward apex; sepals oblong-elliptic to subglobose, rounded at apex; corolla-lobes oblong-elliptic to subglobose, rounded at base and apex, erose, appendages linear-lanceolate, crenulate; staminodia broadly ovate, obtuse at apex, crenulate; ovary broadly ovoid, abruptly contracted into an elongated style; fruit not observed.

Distribution: in sandy or rocky upland woods, Gainesville and Orlando, Florida.

Specimens examined:

FLORIDA: ALACHUA Co.: Gainesville: June 17, 1917, *Harbison* 47 (A, TYPE), 61, 64, 97 (A). ORANGE Co.: near Orlando, *Harbison* 51 (A).

A close examination of this entity reveals that it is not an anomalous form of *B. lanuginosa*, but rather a distinct species, perhaps more closely related to *B. tenax*. It is distinguished from *B. tenax* by its broad leaves and silvery pubescence. In shape of leaf it resembles *B. rufa*, but its pubescence is not at all reddish.

7. *Bumelia rufa* Raf. New Fl. N. Am. 3: 29. 1836; Aut. Bot. 2: 74. 1840.

Bumelia ferruginea Nutt. Sylva **3**: 34. 1849.

Branchlets, petioles, lower surface of leaves and inflorescence densely covered with a tawny pubescence; leaves elliptic, about 5 cm. long, about 3 cm. broad, obtuse or acutish at apex, obtuse or

rounded at base; flowers glomerate or in many-flowered fascicles; pedicels stout, 3.5 mm. long; sepals reniform to oblong-elliptic, rounded at apex; corolla-tube short, lobes suborbicular, truncate at base, appendages lanceolate, acute at apex; staminodia broadly obovate, obtuse at apex; ovary ovoid, gradually contracted into a stout style; fruit not observed.

Distribution: western Florida.

Specimen examined:

FLORIDA: "W. Fla.", *Ware* (P, TYPE).

Although it is not unlikely that the type specimen represents a teratological form of the *B. lanuginosa* complex, convincing evidence for this supposition has not been found. It therefore seems advisable to maintain this species, pending further collections in "W. Fla."

8. *Bumelia lycioides* (L) Pers. Syn. 1: 237. 1805; Gaertn. f. in Gaertn. Fruct. & Sem. 3¹: 127, pl. 202, fig. 3. 1805; DC. Prodr. 8: 189. 1844; Nutt. Sylva 3: 31, pl. 91. 1849; Small in Bull. N. Y. Bot. Gard. 1: 444. 1900.

Sideroxylon spinosum Duham. Arb. 2:260, pl. 68. 1755.

Sideroxylon lycioides L. Sp. Pl., ed. 2, 279. 1762.

Sideroxylon decandrum L. Mant. 48. 1767.

Sideroxylon laeve Walt. Fl. Car. 100. 1788.

Lyciodes spinosum O. Ktze. Rev. Gen. 2: 406. 1891.

Shrub or small tree, 1–8 m. high; branches clothed in gray bark and armed occasionally with short spines; leaves oblong-elliptic to oblong-obovate, 3.5–13 cm. long, 1.5–5 cm. broad, obtuse to acuminate at apex, pale green and prominently reticulate on both surfaces; petioles 5–15 mm. long; flowers numerous; pedicels 2–12 mm. long; perianth scarious, glabrous; sepals and corolla-lobes oblong-elliptic, appendages lanceolate to ovate-lanceolate; staminodia oblong-ovate, obtuse at apex; ovary subglobose, rather abruptly contracted into an elongated style; fruit obovoid to oblong-obovoid, 8–10 mm. long; seed obovoid, 6–8 mm. long.

Distribution: in moist situations, southeastern Virginia to northern Florida, westward to southern Illinois and Louisiana.

Specimens examined: the TYPE specimen, without exact locality and date of collection, is preserved in the Herbarium of the Linnean Society, London (G, photograph).

VIRGINIA: ISLE OF WIGHT Co.: near Smithfield, Oct. 1933, *Stott* (US).

CAROLINA: precise data lacking, *Walter s.n.* (G, fragment of type of *Sideroxylon laeve*).

NORTH CAROLINA: Churchs Isl., *McAtee 1212* (US). NEW HANOVER Co.: *Wrightsville*,

Williamson 111 (P); near Wrightsville Beach, Wilmington, *Harbison 34* (A). ROWAN Co.: near Salisbury, *Biltmore Hb. 1689c* (A).

SOUTH CAROLINA: ABBEVILLE Co.: Calhoun Falls, *Harbison 36* (A). BEAUFORT Co.: Bluffton, *Mellichamp* (A). Horry Co.: Little R. Inlet, *Harris C19598* (US).

GEORGIA: exact locality unknown, *Boykin* (G, M). CAMDEN Co.: St. Marys R., *Harris C21149A* (US). CATOOSA Co.: near Ringgold, Aug. 10, 1895, *Small* (A, US). RICHMOND Co.: Augusta, *Harbison 10* (A). STEWART Co.: along Chattahoochee R., *Harper 1100* (G, M). WALKER Co.: summit of Bluebird Gap, Pigeon Mt., *Harper 365* (NY).

FLORIDA: near Mosquito Inlet, *Curtiss 1761*, in part (M). GADSDEN Co.: River Junction, *Harbison 140* (A). JACKSON Co.: Aspa R., near Aspalaga, July 1843, *Rugel* (M). JEFFERSON Co.: near L. Miccosukee, *Palmer 38459* (A). LAKE Co.: Wekiwa Springs, Aug. 12, 1929, *O'Neill* (US).

ALABAMA: exact locality unknown, *Drake* (G), *Buckley 19* (P). DALLAS Co.: Alabama R., Selma, *Harbison 94* (A). ETOWAH Co.: n. of Attalla, July 9, 1898, *Eggert* (M). JACKSON Co.: Scottsboro, June 30, 1899, *Earle* (NY). JEFFERSON Co.: Powderly, *Palmer 35353* (A, M); along Little Cohaba Cr., *Palmer 38935* (A, M). MARENGO Co.: near Demopolis, *Palmer 27205* (A, M). WILCOX Co.: June 1841, *Buckley* (G, M, US).

MISSISSIPPI: CLARK Co.: Enterprise, *Tracy 3289* (NY). HINDS Co.: s. of Jackson, *Harbison 95* (A). MARION Co.: Columbia, Oct. 28, 1894, *Mohr* (US).

TENNESSEE: DAVIDSON Co.: near Nashville, *Biltmore Hb. 1689b* (A, G, M). DYER Co.: Dyersburg, *Palmer 17263* (A, G, M). FRANKLIN Co.: Cumberland Mt., Cowan, July 21, 1897, *Eggert* (M). MONTGOMERY Co.: bluffs of Cumberland R., Clarksville, *Palmer 17579* (A, M). RUTHERFORD Co.: near Murfreesboro, *Palmer 35496* (A, M).

KENTUCKY: exact locality unknown, 1842, *Short* (G, M, Tu). BALLARD Co.: near Swan Pond, *McFarland, Shacklette & Plymale 43* (M). LOGAN Co.: Russellville, *Palmer 17749* (A, M). LYON Co.: Eddyville, *Palmer 17863, 22506, 23703* (A, M); near Star Lime Works, *Shacklette 440-b* (G). MUHLENBERG Co.: Central City, *Palmer 17731* (A, G, M). WARREN Co.: Jennings' Cr., Bowling Green, May-Aug. 1895, *Price* (A, M),

ILLINOIS: ALEXANDER Co.: Cairo, *Palmer 14930* (A). HARDIN Co.: Cave-in Rock, *Palmer 15473* (A, M). POPE Co.: near Ohio R., Golconda, *Palmer 15376, 23776* (A, M). PULASKI Co.: Mound City: June 1861, *Vasey* (G, M), *Palmer 15078, 16583* (A, M).

LOUISIANA: W. FELICIANA Parish: Wakefield, June 1907, *Cocks* (A).

Though infrequently collected, *B. lycioides* is a variable and widespread species. Like *B. Smallii*, it grows near water-courses.

8a. *Bumelia lycioides* var. *virginiana* Fernald in *Rhodora* 38: 439. 1936; Sarg. Silva 5: pl. 248. 1893.

Shrub or small tree to height of 3 m.; leaves 1.5–13.5 cm. long, 1–3.5 cm. broad generally rounded at apex, bright to pale green; petioles stout, 2–12 mm. long; inflorescence rather few-flowered; pedicels 3–9 mm. long; fruit obovoid; seed pale.

Distribution: dry wooded slopes and margins of streams, southeastern Virginia to Georgia; also southern Indiana.

Specimens examined:

VIRGINIA: ELIZABETH CITY Co.: Ft. Monroe, May 30, 1878, *Chickering* (A). NORFOLK Co.: Sewell's Pt., June 28, 1872, *Curtiss* (G, M). PRINCE GEORGE Co.: near James R., Upper Brandon, *Fernald & Long 9393* (G); Carter's Cr., York R., *Grimes 4269* (G, NY). PRINCESS ANNE Co.: near Third St. bridge, Great Neck: *Fernald & Griscom 4492* (G),

Fernald, Griscom & Long 4688 (G), *Fernald & Long 4987* (G, TYPE, M); Little Neck, *Fernald & Long 4988* (G, M).

NORTH CAROLINA: NEW HANOVER Co.: near Wrightsville, *Biltmore Hb. 1689a* (A, G, M).

SOUTH CAROLINA: BEAUFORT Co.: Bluffton, *Mellichamp* (A).

GEORGIA: FRANKLIN Co.: near Royston, *Palmer 42448* (M).

INDIANA: PERRY Co.: Ohio R. bluffs, above Cannelton, *Deam 16602* (A).

8b. *Bumelia lycioides* var. *ellipsoidalis* Clark, var. nov.⁷

Small tree, 8–10 m. high; leaves elliptic to oblong-elliptic, 5–12 cm. long, 2–4 cm. broad; petioles slender, 4–5 mm. long; inflorescence many-flowered; pedicels 4–8 mm. long, only slightly, if at all, enlarged toward apex; sepals broadly ovate; fruit ellipsoid, 10–15 mm. long, 6–8 mm. broad, black and fleshy; seed 8–10 mm. long, 4–5 mm. broad, tan.

Distribution: in open woods on loess hillsides, Tennessee, south to northern Alabama, Mississippi, and eastern Arkansas.

Specimens examined:

TENNESSEE: DAVIDSON Co.: Nashville: July-Sept. 1879, *Gattinger s.n.* (M, TYPE), July-Aug. 1879, *Gattinger* (A), *Curtiss 1761*, in part, coll. by Gattinger (G, M), Oct. 20, 1887, *Gattinger* (A, M).

ALABAMA: CALHOUN Co.: Tarsus, *Cocks* (A). FRANKLIN Co.: Russellville, Sept. 1893, *Mohr* (A).

MISSISSIPPI: OKTIBBEHA Co.: Agricultural College, *Pollard 1336* (G, M); Starkville, *Tracy 2009* (A).

ARKANSAS: PHILLIPS Co.: Crowley's Ridge near Helena, *Palmer 26649* (A, M).

This variety is characterized by its ellipsoid fruit and its limited distribution.

9. *Bumelia Smallii* Clark, nom. nov.

Bumelia lucida Small in Bull. N. Y. Bot. Gard. 1: 443. 1900; Britt. N. Am. Trees, 778, *fig. 709*. 1908, non Roem. & Schult.

Glabrate shrub or small tree, 2–7 m. high; branches slender, reddish-brown, armed with short spines; leaves numerous, coriaceous, elliptic to elliptic-ovate, 2–5 cm. long, 1–2 cm. broad, acute to occasionally rounded at apex, cuneate at base, dark green and lucid above, paler and dull beneath, reticulate on both surfaces; petioles slender, 3–8 mm. long; flowers rather numerous; pedicels glabrous, slender, 3–7 mm. long; perianth scarious; sepals oblong-elliptic to suborbicular; corolla-lobes oblong-elliptic, appendages ovate-lanceolate, acute at apex, erose; staminodia broadly ovate, obtuse at apex; ovary ovoid; fruit subglobose, 7–10 mm. in diameter, dark

⁷ *Bumelia lycioides* var. *ellipsoidalis* a specie fructu ellipsoideo differt.

bluish-black; seed subglobose, 6–9 mm. in diameter, variegated pale tan and brown.

Distribution: in low wet woods, southeastern Missouri, south to Louisiana and eastern coastal Texas.

Specimens examined:

MISSOURI: BUTLER Co.: Neelyville: *Bush* 6866 (M), *Sargent* 6866 (A). NEW MADRID Co.: Oct. 18, 1856, *Swallow* (M).

ARKANSAS: BRADLEY Co.: Warren, *Demaree* 18967 (M). CLAY Co.: Corning, *Demaree* 4235 (M). CRAIGHEAD Co.: bottoms of St. Francis R., Bono, *Demaree* 3532 (M). CRITTENDEN Co.: Turrell, *Demaree* 3728 (M). HEMPSTEAD Co.: along Yellow Cr., near McNab, *Palmer* 26725 (A, M). JACKSON Co.: near Newport, *Palmer* 35532 (A, M).

LOUISIANA: exact station lacking: *Riddell* (NY), *Featherman* 95 (NY), 1836, *Hale* (G, M), no date, *Hale* (NY). ARCADIA Parish: Esterwood, *Brown* 6287 (L). E. BATON ROUGE Parish: Baton Rouge, Apr. 3, 1899, *Anders* (L). FELICIANA Parish: 1838, *Carpenter* 19 (NY, TYPE). ORLEANS Parish: New Orleans: *Drummond* 207, in part (G), near L. Ponchartrain, May 1838, *Riddell* (US), Apr. 16, 1846, *Fendler* (M); Audubon Pk., Oct. 6, 1936, Apr. 5, 1937, *Penfound* (Tu). OUACHITA Parish: Monroe, *Brown* 6041 (L). PLAQUEMINES Parish: English Turn on Mississippi R., Sept. 1879, *Langlois* (NY). RAPIDES Parish: Alexandria, *Ball* 528 (G, M). ST. LANDRY Parish: Opelousas, 1880–83, *Letterman* (M). ST. MARTIN Parish: near St. Martinsville, Oct. 16, 1893, *Langlois* (US), 45 (M). TERREBONNE Parish: n. of Houma, Oct. 28, 1912, May 22, 1913, *Wurzlöw* (NY). W. CARROLL Parish: Oak Grove, *Copes* (L).

TEXAS: BRAZORIA Co.: Columbia: *Bush* 141, 945 (M), Brazos R., *Palmer* 5067, 6690 (M). CHAMBERS Co.: White's Ranch, *Tharp* 3218 (UT). JEFFERSON Co.: Beaumont, *Palmer* 12722, 13084 (A, M).

The specific designation of this plant, being preoccupied by Roemer and Schultes' binomial, must be changed. I therefore take pleasure in dedicating this species to the late Dr. John K. Small.

B. Smallii is the complement of *B. lycioides*, inhabiting for the most part the river banks west of the Mississippi River. Its leaves are consistently smaller than in *B. lycioides*, are smooth and shiny, and the pedicels are gracefully cuneate. The fruit is more or less globose.

10. *Bumelia reclinata* (Michx.) Vent. *Choix des Plantes*, pl. 22. 1803; DC. *Prodr.* 8: 190. 1844; Small in *Bull. N. Y. Bot. Gard.* 1: 441. 1900, non Chapm. nec Torr.

Sideroxylon reclinatum Michx. *Fl. Bor. Am.* 1: 122. 1803.

Bumelia macrocarpa Nutt. *Sylva* 3: 34. 1849.

Bumelia lycioides var. *reclinata* (Vent.) Gray, *Syn. Fl. N. Am.* 2¹: 68. 1878.

Bumelia microcarpa Small in *Bull. N. Y. Bot. Gard.* 1: 440. 1900.

Decumbent or ascending shrub, 1–2 m. high; branches slightly geniculate, spinescent; leaves numerous, thin, obovate-spatulate to oblanceolate, 2–7 cm. long, 0.5–4 cm. broad, rounded or retuse at

apex, cuneate at base, dark green and shiny above, paler and dull beneath, rather prominently reticulate; petioles 2–4 mm. long; inflorescence few-flowered; pedicels 3–5 mm. long, enlarged toward apex; sepals oblong-obovate to suborbicular; corolla-lobes suborbicular, slightly erose, appendages lanceolate, slightly erose; staminodia lanceolate, not plicate, slightly erose; ovary glabrous, suborbicular to ovoid, gradually contracted into a stout style; fruit subglobose, 4–6 mm. in diameter, frequently tipped by a persistent style; seed subglobose, 3–6 mm. in diameter, brown, occasionally variegated.

Distribution: in sandy soil, Georgia to Florida and Louisiana.

Specimens examined:

GEORGIA: exact place and date of collection unknown, *Michaux s.n.* (G, fragment of TYPE); complete data lacking, *Nuttall s.n.* (P, type of *B. macrocarpa*). THOMAS Co.: along Ochlockonee R., near Thomasville, May 28–June 6, 1895, *Small* (NY).

FLORIDA: exact locality unknown: *Rugel 101* (M, US), *Garber 24* (G, M). ALACHUA Co.: *Harbison 104, 108* (A); Gainesville: Mar.–June 1876, *Garber s.n.* (NY, type of *B. microcarpa*, US), *Palmer 38429* (A, NY). COLLIER Co.: Tommy Cypress, head of Chokoloskee R., *Small 7751* (NY). DADE Co.: near Homestead Rd. between Cutler and Longview Camp, *Small & Carter 1469* (NY); Homestead to Big Hammock Prairie, *Small, Carter & Small 3406* (N); Camp Jackson to Camp Longview, *Small, Carter & Small 3500* (NY); Paradise Key: *Bessey 2* (A), *Harper 110* (A), *Rehder 898* (A), Royal Palm Pk., *Fisher 54* (US); Camp Jackson, *Britton 218, 219* (NY); Nixon-Lewis Hammock, *Small & Mosier 6400* (NY). DIXIE Co.: near Cross City, *Palmer 27301* (A). FRANKLIN Co.: Chattahoochee, 1896, *Chapman* (M). GADSDEN Co.: River Junction, *Harbison 119, 123* (A). HIGHLANDS Co.: Kissimmee Prairie, e. of L. Istokpoga, *Small, Mosier & DeWinkeler 10897* (NY, US). HILLSBOROUGH Co.: Tampa, June–July 1898, *Ferguson* (M). JACKSON Co.: near Grand Ridge, *Palmer 35266* (A, M, NY); Marianna, *Harbison 2, 28* (A). LAKE Co.: Eustis, *Nash 1261* (G, NY). LEE Co.: n. of Bonita Springs, *Seibert 1386* (M); Estero, Jan. 28, 1920, *Ames* (A); Ft. Myers: *Standley 154* (A, G, M, NY), *Hitchcock 199* (G, M, NY); Samville, June 6, 1912, *Harshberger* (NY). LEON Co.: s. of Tallahassee, *Palmer 38484* (A). MANATEE Co.: Manatee, June 1878, *Garber* (G). MONROE Co.: Long Key: *Small & Wilson 1852* (NY, US), *Small & Carter 2912, 2986, 2987, 2988, 2988a* (NY); Flamingo, Cape Sable Region, *Small, Small & DeWinkeler 11537* (G, NY, US). OKEECHOBEE Co.: Okeechobee Prairie, e. of Ft. Bassinger, *Small, Mosier & DeWinkeler 10944* (G, M, NY). OSCEOLA Co.: *Fredholm 5832* (G, NY). SARASOTA Co.: s. of Venice, *Seibert 1392* (M). SUWANNEE Co.: banks of Suwannee R., Branford, *Curtiss 6656* (A, G, M, NY). TAYLOR Co.: near Hampton Springs, *Palmer 38471* (A, M, NY); Perry, *Harbison 3* (A). VOLUSIA Co.: near Mosquito Inlet, *Curtiss 1761*, in part (A, G, M, NY); near Seville, *Curtiss 6690* (A, G, M, NY); edge of causeway, n. of St. Johns R. bridge, *Baker 516* (A). WAKULLA Co.: St. Marks, *Harbison 1503* (A).

LOUISIANA: exact locality unknown, *Hale* (G, NY).

11. *Bumelia cassinifolia* Small in Bull. N. Y. Bot. Gard. 1: 442. 1900; Britt. N. Am. Trees, 778, *fig. 708*. 1908.

Glabrous shrub or small tree, 5–10 m. high; branches slender, frequently armed with short, stout spines, clothed in reddish-brown

bark; leaves thinnish, oblong-obovate, 2.5–10 cm. long, 1–4.5 cm. broad, acute to rounded at apex, cuneate at base, margins slightly revolute, dark green and reticulate above, paler and puberulent beneath with midvein and secondary nerves prominent; petioles slender, 6–8 mm. long; inflorescence few-flowered, glabrous; pedicels slender, 4–11 mm. long, slightly enlarged toward apex; sepals and corolla-lobes suborbicular, appendages lanceolate or ovate-lanceolate, obtuse to acuminate at apex, erose; staminodia broadly lanceolate or ovate, obtuse at apex; ovary ovoid, gradually contracted into an elongated style; fruit subglobose, 8–12 mm. in diameter; seed subglobose to broadly ovoid, 6–10 mm. long.

Distribution: in moist, sandy soil, southwestern Georgia to Louisiana.

Specimens examined:

GEORGIA: DECATUR Co.: along Flint R., near Bainbridge, *Harbison 1357, 1358* (A).

FLORIDA: JACKSON Co.: n. of Marianna, *Wiegand & Manning 2487* (G).

LOUISIANA: ST. LANDRY Parish: alt. 60 ft., Opelousas, May.–Aug. 11, 1883, *Letterman 287* (NY, TYPE).

B. cassinifolia is a rare plant having the foliage characters of a very vigorous *B. reclinata* and the fruiting characters of *B. Smallii*. It may possibly prove to be of hybrid origin.

12. *Bumelia texana* Buckl. in Bull. Torr. Bot. Club **10**: 91. 1883, as *Texana*; Small in Bull. N. Y. Bot. Gard. **1**: 443. 1900.

Bumelia reclinata Torr. Bot. Mex. Bound. Surv. 109. 1859, *pro parte*, non Vent. nec Chapm.

Bumelia monticola Buckl. in Bull. Torr. Bot. Club **10**: 91. 1883; Sarg. Man., ed. 2, 814, *fig. 725*. 1922.

Armed shrub or small tree, 1–7 m. high, with reddish-brown bark; lower surface of leaves, petioles, and inflorescence glabrescent; leaves coriaceous, generally obovate-spatulate, 1–7 cm. long, 0.5–3 cm. broad, rounded to retuse or even apiculate at apex, often slightly revolute, obtuse to cuneate at base, prominently reticulate and pale green on both surfaces; petioles slender, 3–10 mm. long; inflorescence few-flowered; pedicels 1–6 mm. long, enlarged toward apex; sepals subreniform to suborbicular; corolla-lobes oblong-elliptic, appendages ovate-lanceolate; staminodia ovate-lanceolate, obtuse to rounded at apex; ovary subglobose, abruptly contracted into an elongated style; fruit obovoid, 8–10 mm. long, often tipped by a persistent style; seed oblong-ellipsoid, 6–8 mm. long, variegated, red-brown and tan.

Distribution: in dry limestone soil, Arbuckle Mountains in Oklahoma, and west-central Texas.

Specimens examined:

OKLAHOMA: MURRAY Co.: Arbuckle Mts., *Clark & Williams 510* (M).

TEXAS: mountains near lower crossing of Pecos R., W. Tex., 1875, *Buckley* (NY, TYPE); "W. Tex.-N. Mex.", *Wright 422* (G, NY, US); Live Oak Cr.: *Wright 1434* (A, G, NY), *Bigelow s. n.* (NY, type of *B. reclinata* Torr.). BEXAR Co.: *Jermy 83* (NY), *117* (M); Leon Springs, *Clemens & Clemens 891, 893* (M); Blanco Rd. at Cibolo Cr. crossing, n. of San Antonio, *Metz 419* (NY). BLANCO Co.: Blanco: *Reverchon 1555* (A, M, US), *Cory 15629* (A). BREWSTER Co.: Dog Gap, Santiago Mts.: Apr. 14, 1936, *Cory* (A), *Parks & Cory 18702* (Tr.). BROWN Co.: near Brownwood, *Palmer 29539, 29567* (A). BURNET Co.: Burnet, *Palmer 10257* (A, M). CALLAHAN Co.: Baird, *Palmer 13678, 13679* (A, M). COLEMAN Co.: Santa Anna, *Palmer 10386* (A, M). COKE Co.: Bronte, *Palmer 10355* (A, M). COMAL Co.: New Braunfels, *Lindheimer 199* (M); "Devil's Backbone," *Palmer 12187, 12207* (A); Fischer's Store, *Palmer 12208, 12208a* (A). CONCHO Co.: n.w. of Paint Rock: *Cory 9761, 9763* (A), *Parks & Cory 9762* (Tr). CROCKETT Co.: *Reverchon 97* (G). EDWARDS Co.: *Palmer 10975* (A). EL PASO Co.: mountains, 1875, *Buckley s.n.* (NY, type of *B. monticola*). GILLESPIE Co.: Bear Mt.: *Cory 12925, 12926* (A), *Parks & Cory 12926* (Tr); Fredericksburg, *Palmer 10057* (A, M). HARDIN Co.: s. of Silsbee, *Cory 11278, 11279* (A). HOWARD Co.: Big Spring, *Palmer 12483, 13066* (A, M). IRION Co.: Mertzon, *Palmer 12426* (A, M). KENDALL Co.: Boerne, *Palmer 9840, 10818, 11599, 12270, 13637, 13648* (A, M); Spanish Pass, *Cory 19343* (A). KERR Co.: Kerrville: *Heller 1938* (NY, US), *Mackenson 5* (A), *Palmer 9937, 12210* (A, M); Lacey's Ranch, *Palmer 10007, 11226, 12229a* (A). KIMBLE Co.: Junction, *Palmer 10913* (A, M). MENARD Co.: Menard, *Palmer 11888, 11899* (A). MITCHELL Co.: Colorado: June 9, 1900, *Eggert* (M), *Palmer 13787* (A, M). NOLAN Co.: Sweetwater: *Palmer 12431, 13051, 14522, 14523, 33973* (A, M), Aug. 3, 1934, *Barkley* (M, UO). PALO PINTO Co.: Strawn, *Palmer 14246* (A, M, US). PECOS Co.: near Sheffield, *Ferris & Duncan 2919* (M). REAL Co.: Barksdale, *Palmer 13525* (A, M); Leaky, *Palmer 10148* (A, M). SAN SABA Co.: San Saba, *Palmer 11810* (A, M). SUTTON Co.: head of Llano R., between Sonora and Sawyer Spring, *Eggleston 16729* (NY); s.e. of Sonora: *Cory 15315* (A), *Parks & Cory 15314* (Tr). TERRELL Co.: near Sanderson, *Palmer 33442* (A). TOM GREEN Co.: banks of Concho R., San Angelo: *Reverchon 3868* (M), *Palmer 10322, 10360* (M). UVALDE Co.: bluffs of Frio R., Concan, *Palmer 10203, 11545* (A, M); Uvalde, *Palmer 11321, 11347* (A); Leona R., *Parks & Cory 23871* (Tr). VALVERDE Co.: Comstock, *Palmer 11063* (A); near Shumla, *Palmer 33489* (A, M, NY).

A glabrous or glabrescent shrub or small tree, *B. texana* has leaves which vary from long and spatulate to short and obovate. There may possibly be two elements here; nevertheless *B. texana* and *B. monticola* are conspecific.

13. *Bumelia megacocca* Small in Bull. N. Y. Bot. Gard. **1**: 441. 1900, as *megococca*.

Evergreen, glabrous, thorny shrub with spreading or procumbent branches and with pale bark in angular, corky ridges broken by numerous lenticels; leaves coriaceous, obovate or oblong-ob-lanceolate, 1-3.5 cm. long, 0.5-1.2 cm. broad, rounded or retuse at apex, deep green and somewhat shiny above, paler and prominent-

ly reticulate beneath, slightly revolute, short-petiolate; pedicels stout, 1–3 mm. long; flowers not observed; fruit subglobose, 10–13 mm. in diameter, black; seed 9–10 mm. in diameter, pale, smooth and shiny, variegated.

Distribution: in sandy soil, Florida.

Specimen examined:

FLORIDA: HILLSBOROUGH Co.: Tampa, Oct. 1877, *Garber s.n.* (NY, fragment of TYPE).

The only available material is a fragmentary fruiting specimen which seems to be a *Bumelia*.

14. *Bumelia angustifolia* Nutt. Sylva **3**: 38, *pl.* 93. 1849; Sarg. Silva **5**: 175, *pl.* 249. 1893; Small in Bull. N. Y. Bot. Gard. **1**: 439. 1900.

Bumelia reclinata Torr. Bot. Mex. Bound. Surv. 109. 1859, *pro parte*, non Vent. nec Chapm.

Bumelia cuneata Gray, Syn. Fl. N. Am. **2**¹: 68. 1878, non Sw.

Lyciodes angustifolium O. Ktze. Rev. Gen. **2**: 406. 1891.

Bumelia parvifolia Chapm. Fl. Southeast. U. S., ed. 3, 295. 1897, non A. DC.

Bumelia Schottii Britt. N. Am. Trees, 777. 1908.

Glabrous shrub or small tree, 2–8 m. high; branchlets unarmed and slender or spinescent and stout; leaves numerous, variable, persistent, coriaceous, narrowly oblanceolate-spatulate to obovate, 1–1.5 cm. long, 0.5–2 cm. broad, rounded to acutish at apex, cuneate, pale green or grayish and smooth above, brighter green and obscurely reticulate beneath, margins slightly revolute; petioles 1–10 mm. long; inflorescence few- to many-flowered; pedicels 3–11 mm. long; sepals oblong-elliptic, erose, appendages ovate-lanceolate, acute at apex, erose; staminodia ovate, acute at apex, erose; ovary ovoid, gradually contracted into a slender, elongated style; fruit oblong- to ellipsoid-cylindrical, 8–10 mm. long, purplish-black, fleshy, usually tipped by a long, persistent style; seed oblong-ellipsoid, 6–8 mm. long, narrowed at base, pale.

Distribution: in sandy soil, Florida, Texas and adjacent Mexico, also in Bahama Islands.

Specimens examined:

FLORIDA: BREVARD Co.: Merritts Isl., *Harris C19999* (US). CHARLOTTE Co.: Boca-grande, Jan.–Feb. 1920, *Ames* (A). COLLIER Co.: Ten Thousand Isls., *Simpson 364* (G). DADE Co.: Planter, Key Largo, *Eaton 444* (A); lower end of Old Rhoades Key, Apr. 1911, *Simpson* (A). HILLSBOROUGH Co.: Tampa Bay: *Leavenworth* (G, NY); Paradise Key, *Maxon 10926* (US). LEE Co.: Coconut, *Moldenke 5780* (NY); Ft. Myers, *Chapman 14* (US); Marco, *Standley 12808* (US); Sanibel Isl., Apr. 10, 1886, *Sargent* (A). LEVY

Co.: Cedar Keys, *Garber 25* (G, US). MANATEE Co.: Terra Ceia Isl., *Simpson 276* (G, US). MONROE Co.: Bahia Honda Key, May 1881, *Curtiss 1765* (G, M, US); s. border of everglades, Jan. 1882, *Curtiss 1765* (A, M, US); Big Pine Key, *Seibert 1276, 1311* (M); e. of Cape Sable, Nov. 1912, *Simpson* (A); Key West: *Blodgett s.n.* (NY, part of TYPE, G), *Chapman s.n.* (NY, co-type of *B. parvifolia*), *Rugel 86, 87* (G), *132, 174* (NY), Nov. 28, 1886, *Sargent* (A, G), *Britton 508, 509* (NY), *Small & Small 4909* (G), *Seibert 1236* (M); Lignum-vitae Key, Apr. 1911, *Simpson* (A); Long Key, *Curtiss 503* (A); Marquesas Key, Apr. 12, 1886, *Sargent* (A); Palm Key near Flamingo, *Howell 1146* (A); Sugarloaf Key, *Pennell 9581* (M, NY); Upper Metacombe Key, Nov. 15, *Curtiss* (A).

TEXAS: Torrecillas, *Griffiths 6424* (M). ARANSAS Co.: Copano Bay, *Tharp 1550, 1664* (US, UT). ATASCOSA Co.: *Schulz 108, 482* (US); Campbelton, *Palmer 11230* (A, G). CALHOUN Co.: Indianola: *Cory 11617* (A), *Parks & Cory 11617* (Tr); Magnolia Beach, May 22, 1930, *Tharp* (UT). CAMERON Co.: Brownsville: *Hanson 451* (US), *Runyon 252* (M, US, UT), *Rose & Russell 24190* (A, US), *24190a* (NY); Rio Hondo, *Chandler 7088* (G, M, NY); Santa Maria, May 13, 1889, *Tucker* (A, US). DIMMIT Co.: El Jardin, *Small & Wherry 11889* (NY). FRIO Co.: Dilley, Dec. 16, 1932, *Parks* (Tr). HIDALGO Co.: n.w. of Edinburg, *Clover 1599* (UT); La Joya, Mar. 2, 1940, *Parks* (Tr); near Mission: *Hanson 336* (G, M, NY, US, UT), *Clover 181* (M), *Walker 17819* (Tr); Tabasco, *Clover 1372* (A). JACKSON Co.: E. Karankawa Pt., *Tharp 1419* (UT). LA SALLE Co.: near Encinal, May 1, 1882, *Buckley* (A); near Nueces, Aug. 1881, *Buckley* (A, NY), Oct. 1881, *Buckley* (US). MATAGORDA Co.: w. of gulf: *Cory 11555* (A), *Parks & Cory 11555* (Tr). NUECES Co.: n.w. of Corpus Christi, *Cory 17076* (A); Osa Bay: *Cory 20566* (A), *Parks & Cory 20565* (Tr). STARR Co.: s. of Hebbronville, *Tharp 5936* (UT); near Rio Grande City, Sept. 10-11, 1929, *Tharp* (UT). WEBB Co.: near Laredo: *Rose 18047* (NY, US), Apr. 12, 1936, *Penfound* (Tu), June 1853, *Schott 69½* (NY, type of *B. Schottii*); s. of Milo: *Cory 16901* (A), *Parks & Cory 16900* (Tr).

MEXICO: NUEVO LEON: near Monterrey, *Pringle 2787* (A).

BAHAMA ISLANDS: Hog Isl., New Providence, *Wilson 8317* (M).

A distinct, though variable species, *B. angustifolia* is easily recognized by its entirely glabrous foliage.

DOUBTFUL AND EXCLUDED SPECIES

Bumelia ambigua Ten. Sem. Hort. Neap. 1827.

Bumelia confertiflora Nutt. in Fras. Cat. No. 12. 1813, *nomen nudum*.

Bumelia denticulata Raf. New Fl. N. Am. 3: 29. 1836. Rafinesque later stated, in Aut. Bot. 2: 74. 1840, that this is "certainly no *Bumelia*."

Bumelia lucida Roem. & Schult. Syst. 4: 499. 1819 = *SIDEROXYLON LUCIDUM* Soland. ex Lam., fide DC. Prodr. 8: 194. 1844.

Bumelia pubescens Ten. Sem. Hort. Neap. 1827.

Bumelia serrata Pursh, Fl. Am. Sept. 1: 155. 1814 = *PRUNUS CAROLINIANA* Ait., fide Nutt. Gen. 1: 136. 1818; S. Wats. Bibl. Ind. N. Am. Bot. 304. 1878.

Bumelia serrulata Raf. New Fl. N. Am. 3: 29. 1836.

Bumelia syderoxyloides Hort. ex Lavallée, Arb. Segrez. 160. 1877, *nomen nudum*.

Bumelia undulata Raf. New Fl. N. Am. 3: 28. 1836.

LIST OF COLLECTORS AND EXSICCATAE

Collector's numbers are printed in *italics*; or, when specimens are not numbered, they are indicated by a dash. Numerals in parentheses represent numbers assigned to species in this revision.

- Ames, J. S. — (10); —, —, —, — (14).
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 Beck, L. C. — (1).
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 Beyrich, C. — (1b); — (5).
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 Blodgett, J. L. — (14).
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 Brigham, J. 11 (1b).
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 — & J. W. Williams. 510 (12).
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 — & J. B. DeWinkeler. 9042, 9965 (3).
 — & C. A. Mosier. 6400 (10).
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